Complete Summary

GUIDELINE TITLE

Practice guidelines for obstetrical anesthesia.

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists. Practice guidelines for obstetrical anesthesia: a report by the American Society of Anesthesiologists Task Force on Obstetrical Anesthesia. Anesthesiology 1999 Feb;90(2):600-11. [3 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Intrapartum and postpartum pain

GUIDELINE CATEGORY

Management

CLINICAL SPECIALTY

Anesthesiology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To enhance the quality of anesthesia care for obstetric patients, reduce the incidence and severity of anesthesia-related complications, and increase patient satisfaction.

TARGET POPULATION

Intrapartum and postpartum patients with uncomplicated pregnancies or with common obstetric problems.

INTERVENTIONS AND PRACTICES CONSIDERED

- Perianesthetic evaluation (e.g., history and physical examination, intrapartum platelet count, blood type and screen, perianesthetic recording of fetal heart rate)
- Fasting times for clear liquids and solids for labor and delivery
- Anesthetic choices for labor and delivery including epidural anesthetics, spinal opioids with or without local anesthetics, combined spinal-epidural techniques, regional analgesia and monitored or stand-by anesthetic care for complicated vaginal delivery
- Removal of retained placenta including anesthetic choices and nitroglycerin for uterine relaxation
- Anesthetic choices for cesarean delivery including spinal, epidural and/or general anesthesia
- Postpartum tubal ligation and anesthetic options
- Management of complications including the availability of management resources and basic and advanced life support equipment

MAJOR OUTCOMES CONSIDERED

- Maternal analgesia
- Maternal, fetal and neonatal anesthetic complications
- Maternal, fetal and neonatal obstetric complications
- Maternal comfort and satisfaction

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer conducted an electronic search that covered a 33-year period from 1966 through 1998. The manual search covered a 59-year period of time from 1940 through 1998.

NUMBER OF SOURCE DOCUMENTS

Over 4000 citations were initially identified, yielding a total of 2347 nonoverlapping articles that addressed topics related to the 33 evidence linkages. Following review of the articles, 1819 studies did not provide direct evidence, and were subsequently eliminated. A total of 528 articles (from 57 journals) contained direct linkage-related evidence.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The following terms describe the strength of scientific data when sufficient literature is available.

- Supportive: There is sufficient quantitative information from adequately designed studies to describe a statistically significant relationship ($p < 0.01$) between a clinical intervention and a clinical outcome, using the technique of meta-analysis.
- Suggestive: There is enough information from case reports and descriptive studies to provide a directional assessment of the relationship between a clinical intervention and a clinical outcome. This type of qualitative information does not permit a statistical assessment of significance.
- Equivocal: Qualitative data have not provided a clear direction for clinical outcomes related to a clinical intervention and (1) there is insufficient quantitative information or (2) aggregated comparative studies have found no quantitatively significant differences among groups or conditions.

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The scientific assessment of these Guidelines was based on the following statements, or evidence linkages. These linkages represent directional statements about relationships between obstetrical anesthetic interventions and clinical outcomes.

I. Perianesthetic Evaluation

1. A directed history and physical examination reduces maternal, fetal and neonatal complications.

2a. A routine intrapartum platelet count reduces maternal anesthetic complications.

2b. For pregnancy-induced hypertension, an intrapartum platelet count reduces maternal anesthetic complications.

3. For all parturients, an intrapartum blood type and screen reduces maternal, fetal and neonatal complications.

4. Perianesthetic recording of the fetal heart rate reduces fetal and neonatal complications.

II. Fasting for Labor and Delivery

5a. Oral intake of clear liquids during labor improves patient comfort and satisfaction, and does not increase maternal complications.

5b. Oral intake of solids during labor increases maternal complications.

III. Anesthetic Choices for Labor and Delivery

6a. Epidural techniques versus parenteral opioids: (a) improve maternal analgesia, (b) decrease maternal anesthetic complications, and (c) decrease fetal and neonatal complications.

6b. Epidural techniques versus spinal techniques: (a) improve maternal analgesia and (b) decrease maternal anesthetic complications.

6c. Epidural local anesthetics with opioids versus equal concentrations of epidural local anesthetics without opioids: (a) improves maternal analgesia, but (b) increases maternal, fetal and neonatal anesthetic complications.

6d. Epidural local anesthetics with opioids versus higher concentrations of epidural local anesthetics without opioids: (a) improves maternal analgesia, and (b) reduces maternal, fetal and neonatal anesthetic complications.

6e. Epidural infusion of lower concentrations of local anesthetics with opioids (i.e., bupivacaine concentrations less than 0.125% with opioids versus concentrations equal to 0.125%): (a) provides equivalent maternal analgesia, (b) reduces maternal motor block, but (c) increases opioid-related maternal anesthetic complications.

6f. Epidural infusion of lower concentrations of local anesthetics with opioids (i.e., bupivacaine concentrations less than 0.25% with opioids versus bupivacaine equal to or greater than 0.25%): (a) provides equivalent maternal analgesia, (b) reduces maternal motor block, but (c) increases opioid-related maternal anesthetic complications.

6g. Spinal opioids (with or without local anesthetic) versus parenteral opioids: (a) improve maternal analgesia, (b) reduce maternal, fetal and neonatal anesthetic complications, and (c) improve maternal satisfaction.

6h. Combined spinal-epidural techniques versus epidural local anesthetics: (a) improve maternal analgesia, but (b) increase maternal, fetal and neonatal anesthetic complications.

6i. Administering epidural analgesia at cervical dilatations of 3 to 5 centimeters (versus <3 cm) (a) improves maternal analgesia, (b) reduces maternal, fetal and neonatal obstetric complications, and (c) improves maternal satisfaction.

6j. Administering epidural analgesia at cervical dilatations of 3 to 5 centimeters (versus >5 cm) (a) improves maternal analgesia, (b) reduces maternal, fetal and neonatal anesthetic complications, and (c) improves maternal satisfaction.

6k. Epidural techniques for trial of labor patients: (a) reduces the incidence of cesarean delivery, and (b) reduces maternal, fetal and neonatal obstetric complications, and (c) improves maternal satisfaction.

6l. Monitored/Stand-by anesthesia care for complicated vaginal delivery reduces maternal, fetal and neonatal complications.

IV. Removal of Retained Placenta

7. Regional anesthesia [versus general anesthesia or sedation] for pain management during removal of retained placenta reduces maternal anesthetic complications and improves patient satisfaction.

8. Administration of nitroglycerin for uterine relaxation improves success at removing retained placenta.

V. Anesthetic Choices for Cesarean Delivery

9a. Spinal anesthesia for cesarean section provides maternal comfort and satisfaction without clinically significant maternal, fetal and neonatal anesthetic complications.

9b. Epidural anesthesia for cesarean section provides maternal comfort and satisfaction without clinically significant maternal, fetal and neonatal anesthetic complications.

9c. General anesthesia for cesarean section provides maternal comfort and satisfaction without clinically significant maternal, fetal and neonatal anesthetic complications.

9d. Combined spinal-epidural techniques versus epidural or spinal techniques alone for cesarean section provide maternal comfort and satisfaction without clinically significant maternal, fetal and neonatal anesthetic complications.

VI. Postpartum Tubal Ligation

10a. Local anesthesia for postpartum tubal ligation without preexisting anesthesia (a) improves maternal analgesia, (b) reduces maternal anesthetic complications, and (c) improves maternal satisfaction.

10b. Spinal anesthesia for postpartum tubal ligation without preexisting anesthesia (a) improves maternal analgesia, (b) reduces maternal anesthetic complications, and (c) improves maternal satisfaction.

10c. Epidural anesthesia for postpartum tubal ligation without preexisting anesthesia (a) improves maternal analgesia, (b) reduces maternal anesthetic complications, and (c) improves maternal satisfaction.

10d. General anesthesia for postpartum tubal ligation without preexisting anesthesia (a) improves maternal analgesia, (b) reduces maternal anesthetic complications, and (c) improves maternal satisfaction.

11. A postpartum tubal ligation [i.e., within 8 hours of delivery]: (a) does not increase maternal anesthetic complications, (b) improves patient satisfaction, and (c) improves cost/efficiency.

VII. Management of Complications

12. Availability of resources for management of hemorrhagic emergencies reduces maternal, fetal and neonatal anesthetic complications.

13. Availability of equipment for management of airway emergencies reduces maternal, fetal and neonatal anesthetic complications.

14. Peripartum invasive hemodynamic monitoring for preeclamptic patients reduces maternal, fetal and neonatal anesthetic and obstetric complications.

15. Immediate availability of basic and advanced life-support equipment in the operative area of labor and delivery units reduces maternal, fetal and neonatal complications.

A directional result for each study was initially determined by classifying the outcome as either supporting a linkage, refuting a linkage, or neutral. The results were then summarized to obtain a directional assessment of support for each linkage.

Combined probability tests were applied to continuous data, and an odds-ratio procedure was applied to dichotomous study results. Two combined probability tests were employed as follows: (1) The Fisher Combined Test, producing chi-square values based on logarithmic transformations of the reported p-values from the independent studies, and (2) the Stouffer Combined Test, providing weighted representation of the studies by weighting each of the standard normal deviates by the size of the sample. An odds-ratio procedure based on the Mantel-Haenszel method for combining study results using 2 x 2 tables was used with outcome frequency information. An acceptable significance level was set at $p < 0.01$ (one-tailed) and effect size estimates were calculated. Interobserver agreement was established through assessment of interrater reliability testing. Tests for heterogeneity of the independent samples were conducted to assure consistency among the study results. To control for potential publishing bias, a "fail-safe N" value was calculated for each combined probability test. No search for unpublished studies was conducted, and no reliability tests for locating research results were done.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The American Society of Anesthesiologists (ASA) appointed a Task Force of 11 members to review the published evidence and obtain consultant opinion from a representative body of anesthesiologists and obstetricians. The Task Force members consisted of anesthesiologists in both private and academic practices from various geographic areas of the United States.

The Task Force met its objective in a five-step process. First, original published research studies relevant to these issues were reviewed and analyzed. Second, Consultants from various geographic areas of the United States who practice or work in various settings (e.g., academic and private practice) were asked to participate in opinion surveys and review and comment on drafts of the Guidelines. Third, the Task Force held two open forums at major national meetings to solicit input from attendees on its draft recommendations. Fourth, all available information was used by the Task Force in developing the Guideline recommendations. The fifth and final step is covered in the "Description of Guideline Validation Methods" field.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Consultants from various geographic areas of the United States who practice or work in various settings (e.g., academic and private practice) and who participated in opinion surveys and review and comment on drafts of the Guidelines (see the "Description of Methods to Formulate the Recommendations" field), were surveyed to assess their opinions on the feasibility of implementing the Guidelines as the last step of guideline development.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

I. PERIANESTHETIC EVALUATION

1. History and Physical Examination

Recommendations:

The anesthesiologist should do a focused history and physical examination when consulted to deliver anesthesia care. This should

include a maternal health history, an anesthesia-related obstetric history, an airway examination, and a baseline blood pressure measurement. When a regional anesthetic is planned, the back should be examined. Recognition of significant anesthetic risk factors should encourage consultation with the obstetrician.

2. Intrapartum Platelet Count

Recommendations:

A specific platelet count predictive of regional anesthetic complications has not been determined. The anesthesiologist's decision to order or require a platelet count should be individualized and based upon a patient's history, physical examination and clinical signs of a coagulopathy.

3. Blood Type and Screen

Recommendations:

The anesthesiologist's decision to order or require a blood type and screen or cross-match should be individualized and based on anticipated hemorrhagic complications (e.g., placenta previa in a patient with previous uterine surgery).

4. Perianesthetic Recording of the Fetal Heart Rate

Recommendations:

The fetal heart rate should be monitored by a qualified individual before and after administration of regional analgesia for labor. The Task Force recognizes that continuous electronic recording of the fetal heart rate may not be necessary in every clinical setting (American Academy of Pediatrics [AAP] and American College of Obstetricians and Gynecologists [ACOG], 1997) and may not be possible during placement of a regional anesthetic.

II. FASTING IN THE OBSTETRIC PATIENT

1. Clear Liquids

Recommendations:

The oral intake of modest amounts of clear liquids may be allowed for uncomplicated laboring patients. Examples of clear liquids include, but are not limited to, water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee. The volume of liquid ingested is less important than the type of liquid ingested. However, patients with additional risk factors of aspiration (e.g., morbidly obese, diabetic, difficult airway), or patients at increased risk for operative delivery (e.g., non reassuring fetal heart rate pattern) may have further restrictions of oral intake, determined on a case-by-case basis.

2. Solids

Recommendations:

Solid foods should be avoided in laboring patients. The patient undergoing elective cesarean delivery should have a fasting period for solids consistent with the hospital's policy for non-obstetric patients undergoing elective surgery. Both the amount and type of food ingested must be considered when determining the timing of surgery.

III. ANESTHESIA CARE FOR LABOR AND VAGINAL DELIVERY

A. Overview of Recommendations.

Anesthesia care is not necessary for all women for labor and/or delivery. For women who request pain relief for labor and/or delivery, there are many effective analgesic techniques available. Maternal request represents sufficient justification for pain relief, but the selected analgesia technique depends on the medical status of the patient, the progress of the labor, and the resources of the facility. When sufficient resources (e.g., anesthesia and nursing staff) are available, epidural catheter techniques should be one of the analgesic options offered. The primary goal is to provide adequate maternal analgesia with as little motor block as possible when regional analgesia is used for uncomplicated labor and/or vaginal delivery. This can be achieved by the administration of local anesthetic at low concentrations. The concentration of the local anesthetic may be further reduced by the addition of narcotics and still provide adequate analgesia.

B. Specific Recommendations.

1. Epidural anesthetics

Recommendations:

The selected analgesic/anesthetic technique should reflect patient needs and preferences, practitioner preferences or skills, and available resources. When an epidural local anesthetic is selected for labor and delivery, the addition of an opioid may allow the use of a lower concentration of local anesthetic and prolong the duration of analgesia. Appropriate resources for the treatment of complications related to epidural local anesthetics (e.g., hypotension, systemic toxicity, high spinal anesthesia) should be available. If opioids are added, treatments for related complications (e.g., pruritus, nausea, respiratory depression) should be available.

Recommendations:

Adequate analgesia for uncomplicated labor and delivery should be provided with the secondary goal of producing as little motor block as possible. The lowest concentration of local anesthetic

infusion that provides adequate maternal analgesia and satisfaction should be used. For example, an infusion concentration of bupivacaine equal to or greater than 0.25% is unnecessary for labor analgesia for most patients. The addition of an opioid(s) to a low concentration of local anesthetic may improve analgesia and minimize motor block. Resources for the treatment of potential complications should be available.

2. Spinal Opioids with or without Local Anesthetics

Recommendations:

Spinal opioids with or without local anesthetics may be used to provide effective, though time-limited, analgesia for labor. Resources for the treatment of potential complications (e.g., pruritus, nausea, hypotension, respiratory depression) should be available.

3. Combined spinal-epidural techniques

Recommendations:

Combined spinal-epidural techniques may be used to provide rapid and effective analgesia for labor. Resources for the treatment of potential complications (e.g., pruritus, nausea, hypotension, respiratory depression) should be available.

4. Regional Analgesia and Progress of Labor

Recommendations:

Cervical dilation is not a reliable means of determining when regional analgesia should be initiated. Regional analgesia should be administered on an individualized basis.

5. Monitored or Stand-by Anesthesia Care for Complicated Vaginal Delivery

Recommendations:

Either monitored or stand-by anesthesia care, determined on a case-by-case basis for complicated vaginal delivery (e.g., breech presentation, twins, and trial of instrumental delivery), should be made available when requested by the obstetrician.

IV. REMOVAL OF RETAINED PLACENTA

0. Anesthetic Choices

Recommendations:

Regional anesthesia, general endotracheal anesthesia, or sedation/analgesia may be used for removal of retained placenta. Hemodynamic status should be assessed before giving regional anesthesia to a parturient who has experienced significant bleeding. In cases involving significant maternal hemorrhage, a general anesthetic may be preferable to initiating regional anesthesia. Sedation/analgesia should be titrated carefully due to the potential risk of pulmonary aspiration in the recently delivered parturient with an unprotected airway.

1. Nitroglycerin for Uterine Relaxation

Recommendations:

Nitroglycerin is an alternative to terbutaline sulfate or general endotracheal anesthesia with halogenated agents for uterine relaxation during removal of retained placental tissue. Initiating treatment with a low dose of nitroglycerin may relax the uterus sufficiently while minimizing potential complications (e.g., hypotension).

V. ANESTHETIC CHOICES FOR CESAREAN DELIVERY

Recommendations:

The decision to use a particular anesthetic technique should be individualized based on several factors. These include anesthetic, obstetric and/or fetal risk factors (e.g., elective versus emergency) and the preferences of the patient and anesthesiologist. Resources for the treatment of potential complications (e.g., airway management, inadequate analgesia, hypotension, pruritus, nausea) should be available.

VI. POSTPARTUM TUBAL LIGATION

Recommendations:

Evaluation of the patient for postpartum tubal ligation should include assessment of hemodynamic status (e.g., blood loss) and consideration of anesthetic risks. The patient planning to have an elective postpartum tubal ligation within 8 hours of delivery should have no oral intake of solid foods during labor and postpartum until the time of surgery. Both the timing of the procedure and the decision to use a particular anesthetic technique (i.e., regional versus general) should be individualized, based on anesthetic and/or obstetric risk factors and patient preferences. The anesthesiologist should be aware that an epidural catheter placed for labor may be more likely to fail with longer post-delivery time intervals. If a postpartum tubal ligation is to be done before the patient is discharged from the hospital, the procedure should not be attempted at a time when it might compromise other aspects of patient care in the labor and delivery area.

VII. MANAGEMENT OF COMPLICATIONS

0. Resources for Management of Hemorrhagic Emergencies

Recommendations:

Institutions providing obstetric care should have resources available to manage hemorrhagic emergencies (i.e., large bore iv catheters, fluid warmer, forced air body warmer, blood bank services, equipment for infusing iv fluids and/or blood products rapidly). In an emergency, the use of type-specific or O negative blood is acceptable in the parturient.

1. Equipment for Management of Airway Emergencies

Recommendations:

Labor and delivery units should have equipment and personnel readily available to manage airway emergencies. Basic airway management equipment should be immediately available during the initial provision of regional analgesia (i.e., laryngoscope and assorted blades, endotracheal tubes with stylets, oxygen source, suction source with tubing and catheters, self-inflating bag and mask for positive pressure ventilation, medications for blood pressure support, muscle relaxation, and hypnosis). In addition, portable equipment for difficult airway management should be readily available in the operative area of labor and delivery units.

2. Central Invasive Hemodynamic Monitoring

Recommendations:

The decision to perform invasive hemodynamic monitoring should be individualized and based on clinical indications that include the patient's medical history and cardiovascular risk factors. The Task Force recognizes that not all practitioners have access to resources for utilization of central venous or pulmonary artery catheters in obstetric units.

3. Cardiopulmonary Resuscitation

Recommendations:

Basic and advanced life-support equipment should be immediately available in the operative area of labor and delivery units. If cardiac arrest occurs during labor and delivery, standard resuscitative measures and procedures, including left uterine displacement, should be taken. In cases of cardiac arrest, the American Heart Association has stated the following: "Several authors now recommend that the decision to perform a perimortem cesarean section should be made rapidly, with delivery effected within 4 to 5 minutes of the arrest" (American Heart Association [AHA], 1992).

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Scientific evidence was derived from aggregated research literature with meta-analyses utilized when appropriate, and from surveys, open presentations and other consensus-oriented activities.

The literature relating to 8 evidence linkages contained enough studies with well-defined experimental designs and statistical information to conduct formal meta-analyses. These eight linkages were: linkage 6a [epidural versus parenteral techniques for labor], 6b [epidural versus single-shot spinal techniques for labor], 6c [epidural local anesthetics with opioids versus equal dosages of local anesthetics without opioids], 6d [epidural local anesthetics with opioids versus higher concentrations of local anesthetics without opioids], 6e [epidural infusion of local anesthetic (bupivacaine) concentrations of less than 0.125% versus concentrations equal to 0.125%], 6h [combined spinal-epidural techniques versus epidural local anesthetics for labor], 6k [epidural anesthesia for trial of labor], and 9c [general anesthesia versus epidural or spinal anesthesia for cesarean delivery].

The findings of the literature analyses were supplemented by the opinions of Task Force members as well as by surveys of the opinions of a panel of Consultants.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Effective maternal analgesia
- Reduced maternal, fetal and neonatal anesthetic complications
- Reduced maternal, fetal and neonatal obstetric complications
- Improved maternal satisfaction

POTENTIAL HARMS

- Maternal complications related to epidural or spinal local anesthetics include hypotension, systemic toxicity, high spinal anesthesia, motor block, and postdural puncture headache.
- Maternal complications related to epidural or spinal opioids include pruritus, nausea and respiratory depression.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

1. Practice guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints.
2. Practice guidelines are not intended as standards or absolute requirements. The use of practice guidelines cannot guarantee any specific outcome. Practice guidelines are subject to periodic revision as warranted by the evolution of medical knowledge, technology, and practice. The guidelines provide basic recommendations that are supported by analysis of the current literature and by a synthesis of expert opinion, open forum commentary, and clinical feasibility data.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists. Practice guidelines for obstetrical anesthesia: a report by the American Society of Anesthesiologists Task Force on Obstetrical Anesthesia. Anesthesiology 1999 Feb;90(2):600-11. [3 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999

GUIDELINE DEVELOPER(S)

American Society of Anesthesiologists - Medical Specialty Society

SOURCE(S) OF FUNDING

American Society of Anesthesiologists

GUIDELINE COMMITTEE

Task Force on Obstetrical Anesthesia

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

ENDORSER(S)

Not applicable

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Society of Anesthesiologists Web site.

Print copies: Available from the American Society of Anesthesiologists, 520 N. Northwest Highway, Park Ridge, IL 60068-2573.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Arens JF. A practice parameters overview. Anesthesiology 1993 Feb;78(2):229-30.

NGC STATUS

This summary was completed by ECRI on May 31, 1999. The information was verified by the guideline developer on July 14, 1999.

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